PTO/SB/08a (08-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	10810756
Filing Date	2004-03-26
First Named Inventor	Hu
Art Unit	2166
Examiner Name	Ahluwalia, Navneet
Attorney Docket Number	oracle01.028

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
/NKA/	1	6282540	B1	2001-10-28	Goldensher, et al.	See the attached IPRP

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	10810756
	Filing Date	2004-03-26
	First Named Inventor	Hu
	Art Unit	2166
	Examiner Name	Ahluwalia, Navneet
	Attorney Docket Number	oracle01.028

	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/Navneet K Ahluwalia/	Date Considered	12/05/2008

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99)**

Application Number	10810756
Filing Date	2004-03-26
First Named Inventor	Hu
Art Unit	2166
Examiner Name	Ahluwalia, Navneet
Attorney Docket Number	oracle01.028

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Gordon E. Nelson/	Date (YYYY-MM-DD)	2008-12-04
Name/Print	Gordon E. Nelson	Registration Number	30,093

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(oracle01.028**)**

Applicant: HU, et al. **Confirmation No:** 9081

Application No: 10/810,756 **Group Art Unit:** 2166

Filed: 3/26/2004 **Examiner:** Ahluwalia, Navneet

Title: *A database management system with persistent, user-accessible bitmap values*

Commissioner for Patents
Alexandria, VA 22313-1450

Relevance of the References in the Information Disclosure Statement and Certification under 37 C.F.R. 1.97(e)(2)

The references listed in the Information Disclosure Statement were cited in PCT/US05/09052, Hu, et al., *Database management system with persistent, user-accessible bitmap values*, filed 17 March 2005, which claims priority from the above application. The reference in the Information Disclosure Statement was cited in an *International Preliminary Report on Patentability* which issued in the PCT application on 9 September 2008. The other reference cited in the *International Preliminary Report,* Depledge, U.S 5,884,307, is already of record in the prosecution of the above application. A copy of the *International Preliminary Report* is attached.

Applicants' attorney hereby certifies that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in §156 (c) more than three months prior to the filing of the information disclosure statement.

Respectfully submitted,

/Gordon E. Nelson/
Attorney of record,
Gordon E. Nelson
57 Central St., P.O. Box 782
Rowley, MA, 01969,
Registration number 30,093
Voice: (978) 948-7632
Fax: (617) 788-0932

December 1, 2008
Date

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
GORDON E. NELSON
57 CENTRAL ST., P.O. BOX 782
ROWLEY, MA 01969

PCT

NOTIFICATION OF TRANSMITTAL OF
INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Rule 71.1)

Date of mailing (*day/month/year*) 09 SEP 2008

Applicant's or agent's file reference

ORACLE01.062

IMPORTANT NOTIFICATION

International application No.	International filing date (*day/month/year*)	Priority date (*day/month/year*)
PCT/US03/09052	17 March 2003 (17.03.2003)	26 March 2004 (26.03.2004)

Applicant

ORACLE INTERNATIONAL CORPORATION

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the *PCT Applicant's Guide*.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purpose of deciding whether, in that State, the claimed invention is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the IPEA/US
Mail Stop PCT, Attn: IPEA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (571) 273-3201

Authorized officer
Alan T. Rollins

Telephone No. 571-272-8380

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
GORDON E. NELSON
57 CENTRAL ST., P.O. BOX 782
ROWLEY, MA 01969

PCT

NOTIFICATION OF TRANSMITTAL OF
INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Rule 71.1)

Date of mailing *(day/month/year)*	09 SEP 2008
Applicant's or agent's file reference ORACLE01.042	IMPORTANT NOTIFICATION

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US05/09052	17 March 2005 (17.03.2005)	26 March 2004 (26.03.2004)

Applicant

ORACLE INTERNATIONAL CORPORATION

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the *PCT Applicant's Guide*.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed invention is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the IPEA/ US
Mail Stop PCT, Attn: IPEA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (571) 273-3201

Authorized officer
Alan T. Hossin

Telephone No. 571-273-8300

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Form PCT/IPEA/416
ORACLE01.042		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US05/00052	17 March 2005 (17.03.2005)	26 March 2004 (26.03.2004)

International Patent Classification (IPC) or national classification and IPC

IPC: **G06F 17/30**(2006.01);**G06F 9/44**(2006.01)
USPC: 707/7.9;717/106

Applicant

ORACLE INTERNATIONAL CORPORATION

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 9 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *(sent to the applicant and to the International Bureau)* a total of ____ sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) ____ , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☒	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
03 October 2005 (03.10.2005)	20 June 2006 (20.06.2006)
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Alam T. Hasan Telephone No. 571-273-8300

Form PCT/IPEA/409 (cover sheet)(April 2007)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US05/09052

Box No. I Basis of the report

1. With regard to the language, this report is based on:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into English, which is the language of a translation furnished for the purposes of:

☐ international search (under Rules 12.3(a) and 23.1(b))

☐ publication of the international application (under Rule 12.4(a))

☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

☒ the international application as originally filed/furnished

☒ the description:
pages 1-34 as originally filed/furnished
pages* NONE received by this Authority on
pages* NONE received by this Authority on

☒ the claims:
pages 35-43 as originally filed/furnished
pages* NONE as amended (together with any statement) under Article 19
pages* NONE received by this Authority on
pages* NONE received by this Authority on

☒ the drawings:
pages 1/10-10/10 as originally filed/furnished
pages* NONE received by this Authority on
pages* NONE received by this Authority on

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages
☐ the claims, Nos.
☐ the drawings, sheets/figs
☐ the sequence listing *(specify)*:
☐ any table(s) related to the sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages
☐ the claims, Nos.
☐ the drawings, sheets/figs
☐ the sequence listing *(specify)*:
☐ any table(s) related to the sequence listing *(specify)*:

5. ☐ This report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 70.2(c)).

** If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No
PCT/US05/09052

Box No. IV Lack of unity of invention

1. ☐ In response to the invitation to restrict or pay additional fees the applicant has, within the applicable time limit:

☐ restricted the claims.

☐ paid additional fees.

☐ paid additional fees under protest, and, where applicable, the protest fee

☐ paid additional fees under protest but the applicable protest fee was not paid

☐ neither restricted the claims nor paid additional fees

2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:

☐ complied with.

☒ not complied with for the following reasons:

1-47,48-55,56-57
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

I. Claims 1 – 47 are drawn to user accessible operations on bitmap values, classified in class 707, subclass 9.
II. Claims 48 – 55 are drawn to electronic product codes in a digital system and their transfer, classified in class 717, subclass 106.
III. Claim s 56 – 57 are drawn towards data indexing and identifying of attributes, classified in class 707, subclass 7.

4. Consequently, this report has been established in respect of the following parts of the international application:

☒ all parts

☐ the parts relating to claims Nos. _____

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US05/09052

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	NONE	YES
	Claims	1-57	NO
Inventive Step (IS)	Claims	NONE	YES
	Claims	1-57	NO
Industrial Applicability (IA)	Claims	1-57	YES
	Claims	NONE	NO

2. Citations and Explanations (Rule 70.7)
Please See Continuation Sheet

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

V. 2. Citations and Explanations:

Claims 1 - 57 lack novelty under PCT Article 33(2) as being anticipated by Goldenshtein et al. ('Goldenshtein' herein after) (US 6,282,540 B1) further in view of Depledge et al. ('Depledge' herein after) (US 5,884,307).

Claim1 -- 57 lack an inventive step under PCT Article 33(3) as being obvious over Goldenshtein et al. ('Goldenshtein' herein after) (US 6,282,540 B1) in view of Depledge et al. ('Depledge' herein after) (US 5,884,307).

With respect to claim 1,

Goldenshtein discloses a database management system having the improvement comprising: bitmap values, a bitmap value having a representation of a bitstring wherein set bits specify a set of objects whose definitions are built into the database management system, and user-accessible operations on the bitmap values (column 4 lines 1 -- 49 and lines 62 -- 67 and column 5 lines 32 - 57, Goldenshtein).

Goldenshtein however does not disclose the representation of a bitstring explicitly as claimed.

Depledge teaches the bitmap value having a representation of a string of bits (Figure 4 and column 6 lines 21 -- 38, Depledge)

It would have been obvious to one of ordinary skill in the art of data processing at the time of the present invention to combine the teachings of cited references because both the references are directed in the same field of invention bitmapped indexing. Furthermore, the updating of the bitmapped indexes in Depledge would improve on the query performance with the use of the data tables (column 3 lines 8 -- 31, Depledge).

Claims 2 -- 21 are objected under the same rationale given for claim 1. The citations of the elements claimed and taught are listed below.
With respect to claim 2,

Goldenshtein as modified discloses the database management system set forth in claim 1 wherein the user-accessible operations

Supplemental Box

comprise at least: a set-to-bitmap operation wherein a bitmap value is derived from a given set of the objects (column 4 lines 1 – 49 and lines 62 – 67 and column 5 lines 32 - 57, Goldensher).

With respect to claim 3,
Goldensher as modified discloses the database management system set forth in claim 2 wherein: the derived bitmap value is a new bitmap value that specifies the objects in the given set (column 4 lines 1 – 49 and lines 62 – 67 and column 5 lines 32 - 57, Goldensher).

With respect to claim 4,
Goldensher as modified discloses the database management system set forth in claim 2 wherein: the derived bitmap value is a preexisting bitmap value which now further specifies the objects in the given set (column 4 lines 62 – 67 and column 5 lines 32 - 57, Goldensher).

With respect to claim 5,
Goldensher as modified discloses the database management system set forth in claim 2 wherein: the derived bitmap value is a preexisting bitmap value which now no longer specifies any objects in the given set (column 4 lines 62 – 67 and column 5 lines 32 - 57, Goldensher).

With respect to claim 6,
Goldensher as modified discloses the database management system set forth in claim 1 wherein the user-accessible operations comprise at least: a bitmap-to-set operation wherein the set of the objects specified in a given bitmap value is derived from the given bitmap value (column 4 lines 62 – 67 and column 5 lines 32 - 57, Goldensher).

With respect to claim 7,
Goldensher as modified discloses the database management system set forth in claim 1 wherein the user-accessible operations comprise at least: a bitmap-to-count operation wherein the number of the objects in the set specified in a given bitmap value is derived from the given bitmap value (column 8 lines 17 – 44, Depledge).

With respect to claim 8,
Goldensher as modified discloses the database management system set forth in claim 1 wherein the user-accessible operations comprise at least: an existence operation wherein a value representing the logical value TRUE is returned when a given object belongs to the set of the objects represented by a given bitmap value (column 4 lines 62 – 67 and column 5 lines 32 - 57, Goldensher).

With respect to claim 9,
Goldensher as modified discloses the database management system set forth in claim 1 wherein the user-accessible operations comprise at least: a logical operation on a first bitstring represented by a first bitmap value and a second bitstring represented by a second bitmap value (column 4 lines 62 – 67 and column 5 lines 32 - 57, Goldensher).

With respect to claim 10,
Goldensher as modified discloses the database management system set forth in claim 1 wherein the user-accessible operations comprise at least: a comparison operation on a first bitmap value and a second bitmap value wherein a value representing the logical value TRUE is returned when the first bitmap value and the second bitmap value specify the same set of the objects (column 6 lines 59 – 67, Depledge).

With respect to claim 11,
Goldensher as modified discloses the database management system set forth in claim 1 wherein: the bitmap values include settable bitmap values; and the user-accessible operations comprise at least an assignment operation which sets a target settable bitmap value from a source bitmap value (column 5 lines 32 - 57, Goldensher).

With respect to claim 12,
Goldensher as modified discloses the database management system set forth in claim 1 wherein: the bitmap values include bitmap values that are persistent in the database management system (column 5 lines 32 - 57, Goldensher).

With respect to claim 13,
Goldensher as modified discloses the database management system set forth in claim 12 wherein: the persistent bitmap values include bitmap values in fields of tables of the database management system (column 5 lines 32 - 57, Goldensher).

With respect to claim 14,
Goldensher as modified discloses the database management system set forth in claim 1 wherein: the bitstring is compressed (column 7 lines 48 – 62, Depledge).

With respect to claim 15,
Goldensher as modified discloses the database management system set forth in claim 1 wherein: the objects are identifiers for

Supplemental Box

other objects that exist in the database management system (column 8 lines 1 – 11, Depledge).

With respect to claim 16,
Goldensher as modified discloses the database management system set forth in claim 15 wherein: the identifiers for the other objects are row identifiers of rows in the database management system (column 8 lines 1 – 11, Depledge).

With respect to claim 17,
Goldensher as modified discloses the database management system set forth in claim 16 wherein: the row identifiers are row identifiers returned by a user-defined query executed in the database management system (column 8 lines 1 – 11, Depledge)

With respect to claim 18,
Goldensher as modified discloses the database management system set forth in claim 17 wherein: the query returns a row identifier when a field in the row has an attribute specified in the query, whereby the bitmap value represents the set of fields having the specified attribute (column 11 lines 24 – 37, Depledge).

With respect to claim 19,
Goldensher as modified discloses the database management system set forth in claim 1 wherein: the objects are identifiers for other objects that exist outside the database management system (column 8 lines 1 – 11, Depledge).

With respect to claim 20,
Goldensher as modified discloses the database management system set forth in claim 19 wherein: the identifiers for objects that exist outside the database management system are electronic product codes for product items (Figures 3 – 6, Depledge).

With respect to claim 21,
Goldensher discloses a data storage device, the data storage device being characterized in that: the data storage device contains code which, when executed in a computer system, implements the database management system set forth in claim 1 (similar rejection as for claim 1).

With respect to claim 22,
Goldensher discloses a bitmap value employed in a database management system, the bitmap value representing a first set of first objects, the first objects being external to the database management system and members of the first set being mapped onto a members of a second set of second objects that is defined in the database management system (column 4 lines 1 – 49 and lines 62 – 67 and column 5 lines 32 - 57, Goldensher), and the bitmap value comprising: a mapping specifier that maps a string of bits to a subset of the second set (column 4 lines 1 – 49 and lines 62 – 67 and column 5 lines 32 - 57, Goldensher); and a representation of the string of bits wherein a bit is set in the represented string of bits when the member of the second set that is mapped to the bit has a member of the first set mapped thereto (column 4 lines 1 – 49 and lines 62 – 67 and column 5 lines 32 – 57, Goldensher).
Goldensher however does not disclose the representation of a bitstring explicitly as claimed.
Depledge teaches the bitmap value having a representation of a string of bits (Figure 4 and column 6 lines 21 – 38, Depledge) It would have been obvious to one of ordinary skill in the art of data processing at the time of the present invention to combine the teachings of cited references because both the references are directed in the same field of invention bitmapped indexing. Furthermore, the updating of the bitmapped indexes in Depledge would improve on the query performance with the use of the data tables (column 3 lines 8 – 31, Depledge)

Claims 23 – 35 are objected under the same rationale given for claim 22. The citations of the elements claimed and taught are listed below.
With respect to claim 23,
Goldensher as modified discloses the bitmap value set forth in claim 22 wherein: the second set is ordered (column 4 lines 1 – 49 and lines 62 – 67 and column 5 lines 32 – 57, Goldensher).

With respect to claim 24,
Goldensher as modified discloses the bitmap value set forth in claim 23 wherein: the order of the members of the second ordered set corresponds to values of the members thereof; the mapping specifier specifies the mapping by specifying one or more ranges of the values of the members of the second ordered set to which the string of bits is mapped; and the representation of the string of bits represents strings of bits corresponding to the ranges (column 4 lines 1 – 49 and lines 62 – 67 and column 5 lines 32 - 57, Goldensher).

With respect to claim 25,
Goldensher as modified discloses the bitmap value set forth in claim 24 wherein: the mapping specifier specifies the range of the values by specifying a start value and an end value (4 lines 1 – 49 and lines 62 – 67 and column 5 lines 32 – 57, Goldensher).

With respect to claim 26,
Goldensher as modified discloses the bitmap value set forth in claim 24 wherein: the values include a prefix which determines a range of the values; and the mapping specifier specifies the range of the values by specifying the prefix for the range (column 4 lines 1

-- 49 and lines 62 -- 67 and column 5 lines 32 - 57, Goldenshor)

With respect to claim 27,
Goldenshor as modified discloses the bitmap value set forth in claim 26 wherein: the mapping specifier further specifies the range of the values by using a start value and an end value to specify one or more subranges of the range specified by the prefix (column 4 lines 1 -- 49 and lines 62 -- 67 and column 5 lines 32 - 57, Goldenshor).

With respect to claim 28,
Goldenshor as modified discloses the bitmap value set forth in claim 24 wherein: the objects in the second ordered set are identifiers for objects in the first set (column 5 lines 17 -- 44, Depledge).

With respect to claim 29,
Goldenshor as modified discloses the bitmap value set forth in claim 28 wherein: the identifiers for objects in the first set are electronic product codes for the objects items (Figures 3 -- 6, Depledge).

With respect to claim 30,
The bitmap value set forth in claim 22 wherein: there is a plurality of the bitmap values in the database management system; and certain of the bitmap values are persistent in the database management system (column 8 lines 1 -- 11, Depledge).

With respect to claim 31,
Goldenshor as modified discloses the bitmap values set forth in claim 30 wherein: the persistent bitmap values include bitmap values in fields of tables of the database management system (column 8 lines 1 -- 11, Depledge).

With respect to claim 32,
Goldenshor as modified discloses the bitmap value set forth in claim 22 wherein: the representation of the bitstring is a compressed representation thereof (column 7 lines 48 -- 62, Depledge).

With respect to claim 33,
Goldenshor as modified discloses the bitmap value set forth in claim 22 wherein: there is a plurality of the bitmap values in the database management system; and the database management system provides a plurality of user-accessible operations on the bitmap values (column 11 lines 24 -- 37, Depledge)

With respect to claim 34,
Goldenshor as modified discloses the bitmap value set forth in claim 33 wherein: certain of the user-accessible operations alter the range specifier and the representation of the bitstring as required to map the represented string of bits to a subset of the second set that is required for the operation (column 11 lines 24 -- 37, Depledge).

With respect to claim 35,
Goldenshor discloses a data storage device, the data storage device being characterized in that: the data storage device contains code which, when executed in a computer system, implements the bitmap value set forth in claim 22 (similar rejection as for claim 22).

With respect to claim 36,
Goldenshor discloses a method employed in a database system of making a bitmap value that represents a first set of objects external to the database system, the method comprising the steps performed in the database system of: mapping the objects onto a second ordered set of identifiers defined in the database management system (4 column 4 lines 1 -- 49 and lines 62 -- 67 and column 5 lines 32 - 57, Goldenshor); mapping a bitstring that is represented in the bitmap value onto a subset of the second set that includes the identifiers onto which the objects have been mapped (column 4 lines 1 -- 49 and lines 62 -- 67 and column 5 lines 32 - 57, Goldenshor); and setting the bits in the bitstring that correspond to the identifiers onto which the objects have been mapped (column 4 lines 1 -- 49 and lines 62 -- 67 and column 5 lines 32 - 57, Goldenshor).
Goldenshor however does not disclose the representation of a bitstring explicitly as claimed.
Depledge teaches the bitmap value having a representation of a string of bits (Figure 4 and column 6 lines 21 -- 38, Depledge)
It would have been obvious to one of ordinary skill in the art of data processing at the time of the present invention to combine the teachings of cited references because both the references are directed to the same field of invention: bitmapped indexing. Furthermore, the updating of the bitmapped indexes in Depledge would improve on the query performance with the use of the data tables (column 3 lines 8 -- 31, Depledge).

Claims 37 -- 43 are objected under the same rationale given for claim 36. The citations of the elements claimed and taught are listed below.
With respect to claim 37,
Goldenshor as modified discloses the method set forth in claim 36 wherein: in the step of mapping the objects, the identifiers in the second set are identical with identifiers that are employed externally to the database system to identify the objects (column 8 lines 1 -- 11, Depledge)

Supplemental Box

With respect to claim 38,

Goldenshcr as modified discloses the method set forth in claim 37 wherein: in the second set, the identifiers are electronic product codes (Figures 3 – 6, Depledge).

With respect to claim 39,

Goldenshcr as modified discloses the method set forth in claim 38 wherein the step of mapping a bitstring comprises the steps of: making a range specifier that specifies a range of the ordered set of identifiers that includes the identifiers into which the objects have been mapped; and mapping the bits in the bitstring to the specified range (column 4 lines 1 – 49 and lines 62 – 67, Goldenshcr).

With respect to claim 40,

Goldenshcr as modified discloses the method set forth in claim 39 wherein the step of making a range specifier includes the step of: making a start value and an end value which together specify the range (column 5 lines 32 - 57, Goldenshcr).

With respect to claim 41,

Goldenshcr as modified discloses the method set forth in claim 39 wherein the step of making a range specifier includes the step of making a prefix value which specifies the range (column 5 lines 32 - 57, Goldenshcr).

With respect to claim 42,

Goldenshcr as modified discloses the method set forth in claim 36 further comprising the step of: compressing the bitstring (column 7 lines 48 – 62, Depledge).

With respect to claim 43,

Goldenshcr discloses a data storage device, the data storage device being characterized in that: the data storage device contains code which, when executed in a computer system, implements the method set forth in claim 36 (similar rejection as for claim 36).

With respect to claim 44,

Goldenshcr discloses a bitmap value employed in a database management system to represent a first subset of the row identifiers defined in the database management system, the bitmap value comprising: a mapping specifier that maps a string of bits to a second subset of the set of row identifiers (column 4 lines 1 – 49 and lines 62 – 67 and column 5 lines 32 - 57, Goldenshcr); and a representation of the string of bits wherein a bit is set in the represented string of bits when the member of the second subset that is mapped to the bit corresponds to a member of the first subset (column 4 lines 1 – 49 and lines 62 – 67 and column 5 lines 32 - 57, Goldenshcr); and the first subset is returned by a user-defined query executed by the database management system (column 4 lines 1 – 49 and lines 62 – 67 and column 5 lines 32 - 57, Goldenshcr).

Goldenshcr however does not disclose the representation of a bitstring explicitly as claimed.

Depledge teaches the bitmap value having a representation of a string of bits (Figure 4 and column 6 lines 21 – 38, Depledge)

It would have been obvious to one of ordinary skill in the art of data processing at the time of the present invention to combine the teachings of cited references because both the references are directed in the same field of invention bitmapped indexing. Furthermore, the updating of the bitmapped indexes in Depledge would improve on the query performance with the use of the data tables (column 3 lines 8 – 31, Depledge).

Claims 45 – 47 are objected under the same rationale given for claim 44. The citations of the elements claimed and taught are listed below.

With respect to claim 45,

Goldenshcr as modified discloses the bitmap value set forth in claim 44 wherein: the database management system dynamically alters the mapping specifier and the representation of the string of bits as required to map the representation of the string of bits to a second subset of the row identifiers that includes the first subset of the row identifiers (column 8 lines 1 – 11, Depledge).

With respect to claim 46,

Goldenshcr as modified discloses the bitmap value set forth in claim 44 wherein: the query returns a row identifier when a field in the row identified by the row identifier has an attribute specified in the query, whereby the bitmap value represents the set of fields whose values have the specified attribute (column 4 lines 1 – 49 and lines 62 – 67, Goldenshcr).

With respect to claim 47,

Goldenshcr discloses a data storage device, the data storage device being characterized in that: the data storage device contains code which, when executed in a computer system, implements the method set forth in claim 44 (similar rejection as for claim 44).

Claims 1 – 57 meet industrial applicability as defined by PCT Article 33(4).

---------- NEW CITATIONS ----------

US 2005/0060293 A1 (Day et al.) 17 March 2005 see paragraphs 9-10,22,24,37

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether:

(i) the claim is unchanged;

(ii) the claim is cancelled;

(iii) the claim is new;

(iv) the claim replaces one or more claims as filed;

(v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."

2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."

3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."

4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

If a demand for international preliminary examination is made, the written opinion of the International Searching Authority will, except in certain cases where the International Preliminary Examining Authority did not act as International Searching Authority and where it has notified the International Bureau under Rule 66.1*bis*(b), be considered to be a written opinion of the International Preliminary Examining Authority. If a demand is made, the applicant may submit to the International Preliminary Examining Authority a reply to the written opinion together, where appropriate, with amendments before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later (Rule 43*bis*.1(c)).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide*, Volume II.